

IN THE CLAIMS:

Claims 3 through 11, 13, 14, 16 17 and 19 are currently pending in the above-identified application. Please cancel Claims 1, 2, 12, 15 and 18 without prejudice or disclaimer. Also, please amend Claims 3, 5, 7, 8, 13, 14 and 19, as follows:

1.-2. (Cancelled)

3. (Currently Amended) A semiconductor optical device, comprising:

an InP substrate;

an active region formed above the InP substrate, said active region being comprised of a quantum well structure;

optical guiding layers each formed on and under said active region; and

clad layers;

wherein on sides in the direction crossing the light-emitting direction, the sides of the active region are buried with semiconductor layers having band gap energy greater than that of a quantum well layer; and

wherein a composition of Al of the quantum well layer is in the group consisting of InGaAlAs compound semiconductor layers, a composition ratio of the Al being in the range of 0 to 0.13, both inclusive ~~The semiconductor optical device according to claim 1, wherein~~

the InGaAlAs is in the group consisting of compositions A (In: 0.87, Ga: 0, Al: 0.13), B (In: 1.0, Ga: 0, Al: 0), C (In: 0, Ga: 1.0, Al: 0), and D (In: 0, Ga: 0.87, Al: 0.13) in the composition diagram of the four-element based compound semiconductor materials ($\text{In}_{1-x-y}\text{Ga}_x\text{Al}_y\text{As}$).

4. (Original) A semiconductor optical device, comprising:

an InP substrate;

an active region formed above the InP substrate, said active region being comprised of a quantum well structure;

optical guiding layers each formed on and under said active region; and

clad layers;

wherein on sides in the direction crossing the light-emitting direction, the sides of the active region are buried with semiconductor layers having band gap energy

greater than that of a quantum well layer;

wherein the composition ($\text{In}_{1-x-y}\text{Ga}_x\text{Al}_y\text{As}$) of the quantum well layer is in the group consisting of compositions E (In: 0.52, Ga: 0, Al: 0.48), F (In: 0.53, Ga: 0.47, Al: 0), C (In: 0, Ga: 1.0, Al: 0), and G (In: 0, Ga: 0, Al: 1.0) in the composition diagram of the four-element based compound semiconductor materials; and

wherein the quantum well layer has tensile strain.

5. (Currently Amended) A semiconductor optical device, comprising:

an InP substrate;

an active region formed above the InP substrate, said active region being comprised of a quantum well structure;

optical guiding layers each formed on and under said active region; and

clad layers;

wherein on sides in the direction crossing the light-emitting direction, the sides of the active region are buried with semiconductor layers having band gap energy greater than that of a quantum well layer; and

wherein a composition of Al of the quantum well layer is in the group consisting of InGaAlAs compound semiconductor layers, a composition ratio of the Al being in the range of 0 to 0.13, both inclusive ~~The semiconductor optical device according to claim 1, wherein~~

the InGaAlAs layer is in the group consisting of compositions H (In: 0.53, Ga: 0.34, Al: 0.13), F (In: 0.53, Ga: 0.47, Al: 0), C (In: 0, Ga: 1.0, Al: 0), and D (In: 0, Ga: 0.87, Al: 0.13) in the composition diagram of the four-element based compound semiconductor materials ($\text{In}_{1-x-y}\text{Ga}_x\text{Al}_y\text{As}$), and has tensile strain.

6. (Original) The semiconductor optical device according to claim 5, wherein

the photoluminescence wavelength from the active region is within the range of 1.25 [.] μm to 1.35 [.] μm .

7. (Currently Amended) A semiconductor optical device, comprising:

an InP substrate;

an active region formed above the InP substrate, said active region being comprised of a quantum well structure;

optical guiding layers each formed on and under said active region; and
clad layers;

wherein on sides in the direction crossing the light-emitting direction, the sides
of the active region are buried with semiconductor layers having band gap energy
greater than that of a quantum well layer; and

wherein a composition of Al of the quantum well layer is in the group
consisting of InGaAlAs compound semiconductor layers, a composition ratio of the
Al being in the range of 0 to 0.13, both inclusive ~~The semiconductor optical device~~
~~according to claim 5, wherein~~

the InGaAlAs layer is in the group consisting of compositions H (In: 0.53, Ga: 0.34, Al: 0.13), I (In: 0.53, Ga: 0.4, Al: 0.07), J (In: 0.4, Ga: 0.6, Al: 0), K (In: 0.26, Ga: 0.74, Al: 0) and L (In: 0.46, Ga: 0.41, Al: 0.13) in the composition diagram of the four-element based compound semiconductor materials ($\text{In}_{1-x-y}\text{Ga}_x\text{Al}_y\text{As}$); and has tensile strain.

8. (Currently Amended) A semiconductor optical device, comprising:

an InP substrate;

an active region formed above the InP substrate, said active region being
comprised of a quantum well structure;

optical guiding layers each formed on and under said active region; and
clad layers;

wherein on sides in the direction crossing the light-emitting direction, the sides
of the active region are buried with semiconductor layers having band gap energy
greater than that of a quantum well layer; and

wherein a composition of Al of the quantum well layer is in the group
consisting of InGaAlAs compound semiconductor layers, a composition ratio of the
Al being in the range of 0 to 0.13, both inclusive, ~~The semiconductor optical device~~
~~according to claim 5,~~

wherein the photoluminescence wavelength from the active region is within the range of 1.25 μm to 1.35 μm ; and

wherein the InGaAlAs layer is in the group consisting of compositions H (In: 0.53, Ga: 0.34, Al: 0.13), I (In: 0.53, Ga: 0.4, Al: 0.07), J (In: 0.4, Ga: 0.6, Al: 0), K (In: 0.26, Ga: 0.74, Al: 0) and L (In: 0.46, Ga: 0.41, Al: 0.13) in the composition

diagram of the four-element based compound semiconductor materials ($\text{In}_{1-x-y}\text{Ga}_x\text{Al}_y\text{As}$).

9. (Original) The semiconductor optical device according to claim 6, wherein a barrier layer constituting the active region is p-type doped.
10. (Original) The semiconductor optical device according to claim 7, wherein a barrier layer constituting the active region is p-type doped.
11. (Original) The semiconductor optical device according to claim 8, wherein a barrier layer constituting the active region is p-type doped.
12. (Cancelled)
13. (Currently Amended) A semiconductor optical device, comprising:
an InP substrate;
an active region formed above the InP substrate, said active region being comprised of a quantum well structure;
optical guiding layers each formed on and under said active region; and
clad layers;
wherein on sides in the direction crossing the light-emitting direction, the sides of the active region are buried with semiconductor layers having band gap energy greater than that of a quantum well layer; and
wherein a composition of Al of the quantum well layer is in the group consisting of InGaAlAs compound semiconductor layers, a composition ratio of the Al being in the range of 0 to 0.13, both inclusive ~~The semiconductor optical device according to claim 1,~~ wherein
the InGaAlAs layer is in the group consisting of compositions O (In: 0.76, Ga: 0.11, Al: 0.13), P (In: 0.5, Ga: 0.5, Al: 0), Q (In: 0.34, Ga: 0.66, Al: 0), and R (In: 0.55, Ga: 0.32, Al: 0.13) in the composition diagram of the four-element based compound semiconductor materials ($\text{In}_{1-x-y}\text{Ga}_x\text{Al}_y\text{As}$).
14. (Currently Amended) A semiconductor optical device, comprising:

an InP substrate;
an active region formed above the InP substrate, said active region being comprised of a quantum well structure;
optical guiding layers each formed on and under said active region; and
clad layers;
wherein on sides in the direction crossing the light-emitting direction, the sides of the active region are buried with semiconductor layers having band gap energy greater than that of a quantum well layer; and
wherein a composition of Al of the quantum well layer is in the group consisting of InGaAlAs compound semiconductor layers, a composition ratio of the Al being in the range of 0 to 0.13, both inclusive, ~~The semiconductor optical device according to claim 1,~~
 wherein the InGaAlAs layer is in the group consisting of the compositions O (In: 0.76, Ga: 0.11, Al: 0.13), P (In: 0.5, Ga: 0.5, Al: 0), Q (In: 0.34, Ga: 0.66, Al: 0), and R (In: 0.55, Ga: 0.32, Al: 0.13) in the composition diagram of the four-element based compound semiconductor materials ($\text{In}_{1-x-y}\text{Ga}_x\text{Al}_y\text{As}$); and
 wherein the photoluminescence wavelength from the active region is within the range of 1.36 [.] μm to 1.49 [.] μm .

15. (Cancelled)
16. (Original) The semiconductor optical device according to claim 13, wherein a barrier layer constituting the active region is p-type doped.
17. (Original) The semiconductor optical device according to claim 14, wherein a barrier layer constituting the active region is p-type doped.
18. (Cancelled)
19. (Currently Amended) An optical module at least including a package substrate and a semiconductor optical device mounted on the package substrate,
wherein said semiconductor optical device is a semiconductor optical device, comprising: an InP substrate; an active region formed above the InP substrate, said

active region being comprised of a quantum well structure; optical guiding layers each formed on and under said active region; and clad layers,

wherein on sides in the direction crossing the light-emitting direction, the sides of the active region are buried with semiconductor layers having band gap energy greater than that of a quantum well layer, and

wherein a composition of Al of the quantum well layer is in the group consisting of InGaAlAs compound semiconductor layers, a composition ratio of the Al being in the range of 0 to 0.13, both inclusive, The optical module according to claim 18,

wherein the sealing structure of the optical module is of non-hermitic sealing;
and

wherein the semiconductor optical device is at least mounted on the package substrate without using a temperature controller.